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Monthly Statistical Report

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OCTOBER 1982

ESTIMATED U.S. PETROLEUM BALANCE

PRODUCTS SUPPLIED[1/]

Total domestic products supplied during October were 658 MBD (4.2%) below a year ago. Lower levels of residual fuel oil supplied accounted for about three-quarters of the total decline. On a deseasonalized basis, deliveries of petroleum products have declined about one percent over the last four months when compared with the first six months of 1982.

The level of gasoline supplied during October showed an increase of about 0.5% (30 MBD) over a year ago. For the year to date, the level of gasoline supplied is marginally below the corresponding year-ago period. Prices adjusted for inflation continued to drift downward, showing a 23¢ (17%) decrease since their highs of early last year. This decline in prices over the past year and a half and a concurrent increase in the level of real disposable income failed to produce higher demand levels because of the continuing impact of the substantial 1979-1980 price rises.

Unleaded gasoline's market share, at 53.4%, showed no significant change from its performance for the year to date. Mainly as a result of adverse economic conditions, the pace of fleet replacements has slowed. However, cars designed to use unleaded fuel are increasing their share of the vehicle fleet, and the failure of unleaded's market share to increase is surprising.

Distillate fuels supplied declined 6.0% (167 MBD) from last year's level. On a deseasonalized basis, distillate supplied levels continue to show an erratic pattern. July showed a 9% decrease from the prior month, August and September 4% and 8% increases, respectively; October was down more than 6% from the September level. This see-saw pattern seems to arise from movements into and out of secondary storage and, we believe, is not indicative of a corresponding change in consumption.

The level of residual fuel oil supplied fell 26.7% in October — and has dropped more than 18% so far this year — compared with a year ago. The narrowing price gap between natural gas and residual fuel has recently induced some switch-back to oil in the industrial sector. However, electric utilities' oil use for steam generation (mostly residual fuel oil) decreased some 900 MBD between 1978 and 1982 (seven months data), about 70% of the total decline in residual fuel oil supplied. An equal share of the decrease in residual fuel oil supplied for the first seven months of 1982 versus the corresponding period last year is attributable to lower use by utilities. With industrial activity some 9% below last year (September data), the remainder of the decrease is thought to be the result of lower deliveries to the industrial sector and reduced bunker fuel sales.

Kerosine jet fuel was supplied at slightly above last year's rate in October but declined almost 3% from last year on a year-to-date basis. Miles flown for the first eight months of 1982 show a decrease of about 2%. Revenue passenger miles (domestic service) continued to show year-to-year increases in recent months, posting a close to 5% gain for 9 months of 1982 over the corresponding year-earlier period. Larger capacity planes are being used to replace planes taken out of active airline service, yet load factors have remained at about the same level, apparently accounting for the increase in revenue passenger miles despite a decrease in miles flown.

(In millions of B/D)	OCTOBER ESTIMATES			YEAR-TO-DATE ESTIMATES		
	1982	1981	% Change	1982	1981	% Change
—Total domestic products supplied	15.2	15.8	(4.2)	15.3	16.1	(4.8)
—Motor gasoline supplied	6.6	6.6	0.5	6.6	6.6	(0.7)
—Distillate fuel oil supplied	2.6	2.8	(6.0)	2.7	2.8	(3.4)
—Residual fuel oil supplied	1.4	1.9	(26.7)	1.7	2.1	(18.2)

SUPPLY[1/]

Total supply declined 958 MBD (5.9%) versus last October as a result of a 649 MBD drop in imports and a 309 MBD decline in total domestic supply.

Domestic crude oil production was 95 MBD (1.1%) greater than last year; almost the entire increase resulted from higher Alaskan production as a result of flow from the Kuparuk field, which came on stream in December 1981. Lower 48 production was about the same as last year and is now almost 850 MBD greater than would be expected, had the downward trend of the seventies continued.

Imports dropped 11.8% (649 MBD) compared to last October. The current level is about the same as in the early 1970's. Mexico was the number one U.S. supplier in August, the most recent month for which country-of-origin data are available, and is the leading supplier for the first eight months. On a seasonally adjusted basis, imports reached their lowest point this year in March and in recent months have, on average, risen almost 10% versus the first part of the year. A reduction in the rate of inventory withdrawals over the past several months is largely responsible for the recent increase in imports which occurred despite lower deseasonalized petroleum demand.

Total inventories in October continued to be at adequate levels, considering reduced demand, ample available refinery capacity, and the fact that crude oil inventories are still more than 50 million barrels above adequate levels. Gasoline inventories since the mid-70's have averaged about 33 days of supply during October compared with the current 35 day level. Current distillate stocks are also fully adequate in view of lower demand, substantial current and potential production levels, reduced demand seasonality, and available extra refinery capacity. The October refinery utilization rate of close to 73% leaves more than 4 MM barrels of operable refinery capacity available.

This September was the first time in 32 months that well completions reported were below year-ago levels. After adjusting for normal seasonal variations, reported well completions reached an all-time high in May of 1982. While the rotary rig count reached a peak in December 1981, the seasonally-adjusted peak was in January 1982. The movement of the two data series since their respective peaks tends to confirm that the lag between a change in the rig count and a change in completions is about four months. The deseasonalized rig count peaked in January; by June, five months later, active rigs had declined by about 33%. Seasonally adjusted well completions peaked in May and by October had declined by about 27% from the peak level.

(In millions of B/D)	OCTOBER ESTIMATES			YEAR-TO-DATE ESTIMATES		
	1982	1981	% Change	1982	1981	% Change
—Total supply	15.4	16.3	(5.9)	15.7	16.5	(4.9)
—Crude production[2]	8.7	8.6	1.1	8.7	8.6	1.1
—Crude oil imports[3] [4]	3.5	3.9	(9.7)	3.4	4.2	(20.5)
—Product imports	1.3	1.6	(17.0)	1.5	1.6	(5.9)

1/ Total supply, i.e., production plus imports adjusted for net stock change is equal to total products supplied from primary storage. Total products supplied from primary storage less exports is equal to total domestic products supplied. Information contained in this report is derived from information published in the API Weekly Bulletin and is based on historical analysis of the industry. All data reflect the most current information available to the API and include all previously published revisions.

2/ Includes lease condensate.

3/ Beginning with January 1977, the U.S. Department of Energy began reporting crude oil imports as of the date of importation. Previously, this data, with the exception of Canadian crude imports, was reported as of the date it was received at the refinery. This change may affect both the level of crude oil imports and crude oil stocks. API estimates of these data may, therefore, differ slightly from those of the U.S. Department of Energy.

4/ API data do not include crude oil imported for the Strategic Petroleum Reserve (SPR) nor crude oil stocks held in the SPR (according to the U.S. Department of Energy, the SPR held approximately 285 million barrels as of October 31, 1982).

ESTIMATED UNITED STATES PETROLEUM BALANCE

(Daily Average in Thousands of 42 Gallon Barrels)

Supply/Products Supplied From Primary Storage	OCTOBER			YEAR-TO-DATE		
	1982[1]	1981[2]	% Change	1982[3R]	1981[2]	% Change
Products Supplied:						
Motor gasoline	6,608	6,578	0.5	6,552	6,599	(0.7)
Unleaded motor gasoline*	3,529	3,387**	4.2	3,518	3,396**	3.6
Naphtha-jet	196	173	13.3	209	201	4.0
Kerosine-jet	770	759	1.4	789	812	(2.8)
Kerosine	143	134	6.7	124	117	6.0
Distillate fuel oil	2,636	2,803	(6.0)	2,689	2,785	(3.4)
Residual fuel oil	1,381	1,884	(26.7)	1,709	2,089	(18.2)
All other oils[4]	3,699	3,747	(1.3)	3,532	3,713	(4.9)
Reclassified[5]	- 265	- 252	5.2	- 317	- 263	20.5
Total domestic products supplied	15,168	15,826	(4.2)	15,287	16,053	(4.8)
Exports	800	738	8.4	799	578	38.2
Total products supplied	15,968	16,564	(3.6)	16,086	16,631	(3.3)
Supply:						
Domestic production:						
Crude oil[6]	8,658	8,563	1.1	8,660	8,569	1.1
Natural gas liquids	1,536	1,599	(3.9)	1,538	1,608	(4.4)
Other supply[7]	354	695	(49.1)	609	482	26.3
Total domestic supply	10,548	10,857	(2.8)	10,807	10,659	1.4
Imports:						
Crude oil, total 11/	3,530 10/	3,911 10/	(9.7)	3,369 10/	4,237 10/	(20.5)
Canadian	157	173	(9.2)	194	159	22.0
Other	3,373	3,738	(9.8)	3,175	4,078	(22.1)
Products, total	1,311	1,579	(17.0)	1,486	1,579	(5.9)
Residual fuel oil	609	786	(22.5)	730	780	(6.4)
Other	702	793	(11.5)	756	799	(5.4)
Total imports	4,841	5,490	(11.8)	4,855	5,816	(16.5)
Total supply	15,389	16,347	(5.9)	15,662	16,475	(4.9)
Stock change, all oils	- 579	- 217	XXXX	- 424	- 156	XXXX
Refinery Operations						
Input to crude oil distillation units	12,090	12,352	(2.1)	12,213	12,773	(4.4)
Operable capacity	16,663	18,442	(9.6)	17,590	18,642	(5.6)
Refinery utilization (%)[8]	72.6%	67.0%	8.4	69.4%	68.5%	1.3
Crude oil runs	11,725	12,057	(2.8)	11,812	12,506	(5.5)

Stocks (millions bbls.)	1982		1981[2]	% Change from . . .	
	Oct. 31[9]	Sep. 30[9]	Oct. 31	Previous Month	Year Ago
Crude oil 10/	349.3	350.3	364.0	(0.3)	(4.0)
Unfinished oils	111.5	116.8	119.5	(4.5)	(6.7)
Motor gasoline	232.1	236.7r/	236.1	(1.9)	(1.7)
Naphtha-jet	6.1	6.2	6.6	(1.6)	(7.6)
Kerosine-jet	34.6	33.7r/	36.1	2.7	(4.2)
Kerosine	10.7	10.6r/	12.7	0.9	(15.7)
Distillate fuel oil	171.2	163.1r/	201.2	5.0	(14.9)
Residual fuel oil	60.9	59.3r/	79.9	2.7	(23.8)
All other oils	148.0	165.7r/	213.9	(10.7)	(30.8)
Total all oils	1,124.4	1,142.4r/	1,270.0	(1.6)	(11.5)

1/ Based on API estimated data converted to a monthly basis.
2/ Source: U.S. Department of Energy.
3/ Source: January-August, U.S. Department of Energy, September-October, API.
4/ Includes crude losses.
5/ Beginning with January 1981, U.S. Department of Energy began using a new data collection system which encompasses a method to ascertain the amount of product reclassified during the production phase. So that there will be no double counting of these volumes, they are subtracted from total domestic products supplied.
6/ Includes lease condensate.
7/ Includes Unaccounted-for crude oil, Refinery input of other hydrocarbons, and Processing gain.
8/ Represents "Input to crude oil distillation units" as a percent of "Operable capacity."
9/ Derived by interpolating API weekly stocks data.
10/ Data do not include oil imported for the Strategic Petroleum Reserve (SPR) nor crude oil stocks held in the SPR.
11/ Based on refinery receipts of foreign crude oil.
R/ Revised.
* Included in motor gasoline.
** Differs slightly from U.S. Department of Energy figures since API uses refinery shipments to calculate demand.

ADEQUACY OF WINTER HEATING OIL SUPPLY

As the country moves into the winter heating season, distillate fuel supplies appear adequate to meet anticipated demand levels, assuming no interruption in the supply of foreign crude oil to the U.S. The overall reduction in distillate demand levels and seasonality of demand in recent years, means that distillate supply requirements are much less now than formerly. Consequently, current refinery production is now adequate to supply a much larger percentage of demand, while stock withdrawals and imports are much less significant as components of supply. The reduction in the supply contribution from stocks means that inventory levels needed relative to demand, i.e. days of supply, are less now than before. Current stock levels relative to demand are low by historic standards but are entirely adequate to fill requirements. While localized problems due to impassible roads or ice-clogged rivers are always a possibility, consumers should not be concerned about inadequate supplies of heating oil.

Distillate Demand

Total domestic distillate demand for the first nine months of this year was 4 percent below year-ago levels. While there has been some volatility in the month-to-month data — due primarily to changes in secondary storage — demand is now at the lowest levels since 1972. This decrease is noteworthy, considering that the first quarter of the year was eight percent colder than the previous year, and five percent colder than normal. Adjusted for abnormal weather, distillate demand in the last heating season averaged 3.0 MMB/D, 22 percent less than the peak reached in 1978/1979.

The API does not forecast petroleum supply or demand. However, forecasts made by the DOE, IPAA, and several oil companies, of distillate demand in the 1982/83 heating season range from around 3.0 to just over 3.2 million barrels per day. The lower forecast would represent no change from the 1981/82 season, while the higher forecast would represent a 4.6 percent increase from last year. All forecasts are based on normal winter weather and usually assume the economic recovery began in the third quarter of this year.

Seasonality of Distillate Demand

The demand for distillate fuel is subject to a greater degree of seasonal variation than any other major petroleum product. But, as with other petroleum products, changes in demand structure and price-induced conservation have led to less seasonal variation in distillate demand.

Total distillate demand decreased about 18 percent between 1978 and 1981. During the same period, the heating oil component of distillate consumption decreased 35 percent, accounting for 83 percent of the total demand decrease. As most heating oil demand is concentrated in a six-month period, this has had a major impact on reducing peak season demand.

In the early sixties, 64% of total distillate demand was for heating oil; estimates for 1981 place heating oil at roughly 33% of total demand (see Table I). The trends toward fuel switching and conservation have continued this year, although at a lesser rate than in the recent past. Nonetheless, these trends tend to moderate demand further in the peak season.

TABLE I
Distillate Demand by Source
(Percent of Total)

	Heating	On-highway Diesel	Industrial and Utilities	Other
1960	64	5	7	24
1965	61	9	7	23
1970	56	16	9	19
1975	47	21	14	18
1976	47	21	13	19
1977	44	21	16	19
1978	42	23	15	20
1979*	38	27	14	21
1980*	36	31	12	21
1981*	33	33	12	22

Source: Department of Energy and Bureau of Mines "Sales of Fuel Oil and Kerosene."

* For years after 1978, data for heating oil sales no longer given separately. Figures for heating represent the sum of residential, commercial, and farm use. These may exclude use of heating fuel in other categories.

While the heating oil component of distillate demand has been decreasing, the diesel fuel component of distillate demand has been increasing, in both absolute and relative terms. On-highway diesel fuel use increased 600 percent between the early 1960s and 1981, becoming the second largest component of distillate demand. This category is also the only component of distillate demand which has increased from 1979 levels. With diesel an increasing share of total distillate demand, the decrease in total distillate demand during the summer months is now more moderate.

Peak season demand, relative to average demand, is now half as large as in the early sixties. Then, peak season demand was 63% greater than average demand, while in 1981 and 1982 peak season demand was only 35% greater than average demand. Low season demand in the early sixties typically dropped to a level of about 64% of average demand; in 1980 and 1981, low season demand was about 78% of average demand. And we believe that seasonal variation has continued to decrease (see Exhibit I).

In absolute terms, average daily distillate demand varied by about 2 million b/d between yearly high and low in the 1970s, while this year the range is about 1.3 MMBD.

Distillate Fuel Production Capacity

Historically, distillate fuel consumption during the peak heating season has exceeded refinery capacity to meet those peak demand levels from current production.

Domestic distillate demand during the 1981/1982 heating season was at the lowest level since the 1968/1969 heating season. But in the 1968/69 period, for example, current production supplied only 75 percent of demand despite a refinery utilization rate of 88 percent of capacity. In the 1981/82 period, current production met 84 percent of current demand, despite refinery utilization rates of about 68 percent.

It is possible to estimate technically feasible distillate production capacity from available data. Currently, operable refinery capacity is 16.7 million b/d, while operable capacity minus shut down capacity, i.e., operating capacity, is about 15.2 million b/d. Historically, maximum sustainable utilization rates have been about 92 percent and peak season average distillate yields have been about 23 percent. This indicates that attainable production capacity for distillate fuel is at least 3.2 million b/d. This figure is at the upper range of the distillate demand for 1982/83 heating season.

In other words, it is technically possible to satisfy total heating season demand for distillate fuel from production during the same period. While this situation is possible, it is unlikely to happen. Refiners prefer to operate at a more constant level throughout the year, and such high levels of refinery operations could also produce other products in excess of current market requirements. Nonetheless, distillate production could be increased if demand is higher than currently anticipated.

The Role of Distillate Fuel Stocks and Imports

Distillate stock withdrawals, along with refined product imports have traditionally provided the additional distillate supply needed to satisfy peak heating season demand. The decreases in total distillate demand, and the decreases in the seasonal component of distillate demand, combined with increased production capacity have reduced the supply required from these marginal sources.

With current distillate production of 2.9 million b/d, if demand is between 3.0 and 3.2 million b/d, then 0.1 to 0.3 million b/d needed is from imports and stock withdrawals.

During the 1970's net imports, i.e., imports minus exports, of distillate fuel averaged about 300 MBD during the heating season, reaching a peak of 500 MBD in 1974/75. In the 1981/82 heating season, net imports averaged less than 60 MBD. The large decrease in net distillate imports is due to reduced demand and the desire to reduce products stocks in the prior two years.

Net distillate fuel imports are currently running at only a few thousand b/d, due to continued high exports, but distillate is readily available for importation on world markets. Additionally, current exports could be reduced if demand conditions warrant. The DOE forecast places net imports at 100 MBD during the 1982/83 season, but, at a minimum, it would appear that world markets can currently sustain the historic average of 300 MBD. Indeed, excess crude production and refinery capacity appear more than adequate to sustain distillate imports at the 500 MBD peak level should the need arise.

If net distillate imports are 100 MBD, distillate stock withdrawals of up to 200 MBD would be required for the entire heating season — a maximum of 37 million barrels. This amount is readily available from current primary inventories of approximately 170 million barrels.

In 1979, the National Petroleum Council estimated that the minimum operating level of distillate stocks was 125 million bbls., i.e., below this level shortages and other distribution problems would occur. However, earlier this year distillate fuel stocks were drawn down to about 109 million barrels and no supply problems occurred. This would indicate that the minimum operating level may now be close to 100 million barrels. Thus, current distillate inventories can be drawn down by as much as 70 million barrels. This provides 33 million barrels more than the estimated maximum stock requirements for the entire heating season — equivalent to about 0.2 MMBD.

It should be noted that significant stocks of distillate fuel are held by distributors and consumers. These secondary and tertiary stocks are important components in meeting peak season demand levels. While little information on current stock levels is available, indications are that these stocks are at normal levels relative to expected demand. Consequently, secondary and tertiary stocks are available to help satisfy any surge in demand levels due to unexpectedly cold weather.

Composite Supply Outlook

TABLE II

Distillate Supply for the Heating Season
(million barrels per day)

	Available	Attainable
Production	2.9	3.2
Imports (net)	.1	.5
Stock Withdrawal	.2	.4
Total Supply	3.2	4.1

Current distillate production is running at 2.9 MMBD, about 90 percent of anticipated winter demand levels, while refinery capacity is available to increase production by at least 300 MBD.

With production filling a greater percentage of demand, adequate stock levels relative to demand, i.e., days of supply, are now much less than during the 1970's. Then, stocks of distillate fuel averaged about 87 days of supply at this time of year. Current stocks represent only 65 days of supply but are adequate to supply about 400 MBD during the heating season, twice the level required to meet forecast demand, given current production and net imports of 100 MBD.

Effect of a Very Cold Winter

Knowing that distillate supplies are adequate to meet expected "normal" requirements, what additional supply would be needed if unusually cold weather increases distillate demand?

The Department of Energy forecast estimates that a 5% colder than normal winter would add about 70 MBD to total distillate demand for the season. An API analysis indicated that a repetition of the coldest winter in 100 years, about 14% colder than normal, would add about 150 MBD to total distillate demand for the season. This represents the upper bound for added demand due to a cold winter. From the figures above, current stocks are sufficient to fill an increase in demand even in this extreme case.

EXHIBIT I
MONTHLY SEASONAL FACTORS
FOR DISTILLATE FUEL DEMAND